Question - 2

a) **Lipids** :

A disversed group of organic compounds that are hydrophobic (water-soluble) and or amphipalltic (partially soluble) are called lipids. These are made up of carbon, hydrogen and onygen atoms, but they contain fewer onygen atom compared to carbohydrates. lipids are essential for various biological functions, particularly in storing the energy, structural roles and signalling.

Major Types of Lipids

Types	Structure	Functions
Triglycerids	Glycerol + 3 fatty acids	Energy storage, insulation and protection
Phospholipids	Glycerol + 2 fatty acid + PO4	Structural component of cell membrane.
Steroids	4 carbon Ring	Hormones, cholesterol and signalling.
Waxes	long chain fatty acids	water proofing and protection
Glycolipids	lipid + Carbohydrates.	cell recognition and communication.

b) Measures for energy conservation and its sustainable use

1) Promoting Renewable Energy sources:
- Use of solar energy, wind, and hydro and geothermal energy as to fossil fuels.
- Solar panels and wind turbines are clean and renewable options.

2) Sustainable Transportation:
Using low energy vehicles to reduce dependency on fossil fuels.
Also reduces the Carbon emission.
Such as: e-vehicles, metro buses, e-scooty.

Public Bus $\longrightarrow$ low energy use/person

Electric Train $\longrightarrow$ lowest energy use/person

Private Car $\longrightarrow$ high energy/person.

3) <u>Restructuring Building designs:</u>

Adopting the concept of sponge cities where urban area are designed to absorb, store and utilize rainwater. It avoid urban flooding as well, enhance water resources, and improves eco-system.

This concept designed to integrate natural systems like Wetlands, green spaces and permeable surfaces with modern structure.

For instance China had built 30 sponge cities.

o Moving from horizontal to verticle designed building to use real land area for gardening, parks, and ~~forest~~ tree planting.

o Using energy efficient building designs to minimize heating, cooling, and lighting needs.

o Installing Insulation, energy efficient windows, and passive heating (solar) techniques.

4) ## Energy Efficient Appliances:

Using LEDs, (light emitting diodes) bulbs, energy star rated devices and smart home techniques as convertors.

Devices consuming less energy with quality performance.
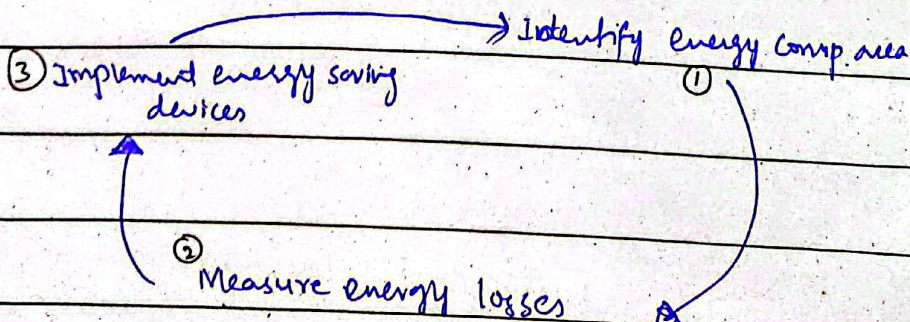
$\Rightarrow$ Energy Consumption Comparision

Traditional Bulbs : <u>60 watts</u> $\rightarrow$ LEDs : 10 watts

Inefficient Motor : 100 units $\rightarrow$ Efficient Motor 75 units

5- ## Energy Audits :

Measures to conduct audits for buildings industries and homes to assess energy consumption patterns. implemented to corrective energy loss minimization measures.

Steps to Energy audit

$\rightarrow$ Identify energy comp. area ①

③ Implement energy saving devices

② Measure energy losses

6- <u>**Policy and Regulations**</u>

Government should enact policies like energy conservation building codes (ECBC) and provide subsides for renewable energy adoption.

○ Strict monitoring of Industries energy consumption is vital.

○ Educating and awaring local people about the Energy conservation.

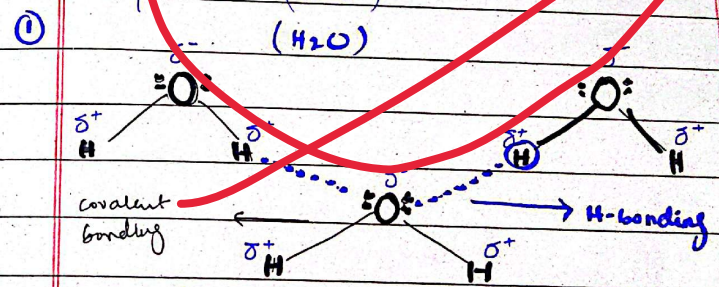→ For instance: adopting a habit to turn off lights when no one is in the room annually can save upto 10-15% energy.

C) <u>**Hydrogen Bonding**</u> :

the bond between the hydrogen atoms chemically, and between the high electronegative atoms such bonds are very weak and its total strength is (5-10 Kcal per bond) it is much less than strength of covalent bond.
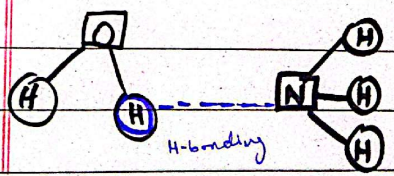
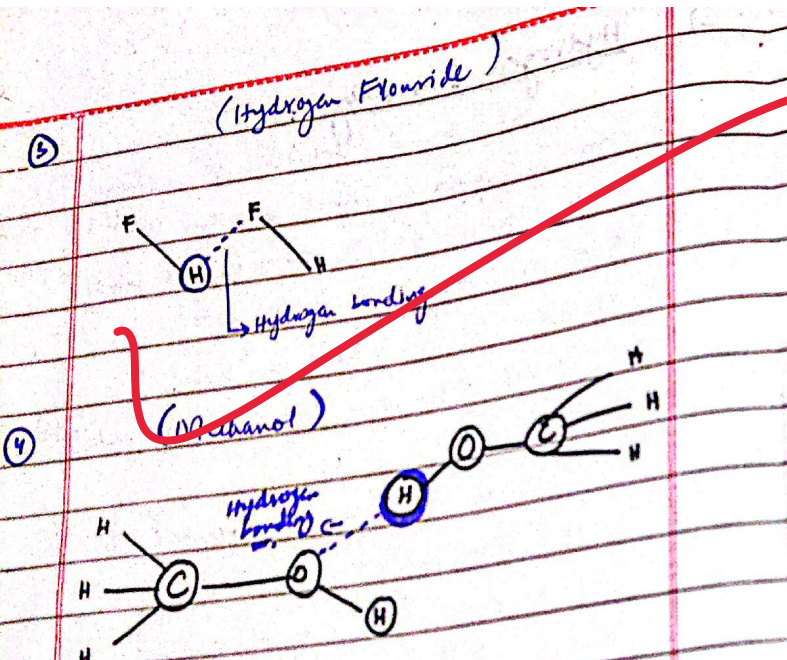The Hydrogen bonds are represented with dotted lines between two atoms (......)

For example:

Hydrogen Bond between two molecules of Water (H$_2$O)

①   (H$_2$O)

②   (H$_2$O + Ammonia NH$_3$)

(Hydrogen Flouride)

③

F ⎯ F

H ⎯ Hydrogen bonding

④

(Methanol)

Hydrogen bonding

a)

Nervous System of the Human Body

The nervous system is made up of the central nervous system (CNS) and peripheral nervous system (PNS). These together work to collect and interpret the data from the body's internal and external environment and control responses.

→ Central Nervous System (CNS)

It manages the body essential functions. Made up of the brain, spinal cord. It recieves the sensory information and coordinates an appropriate response.
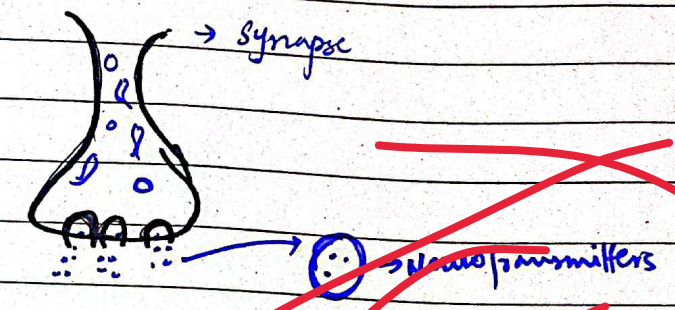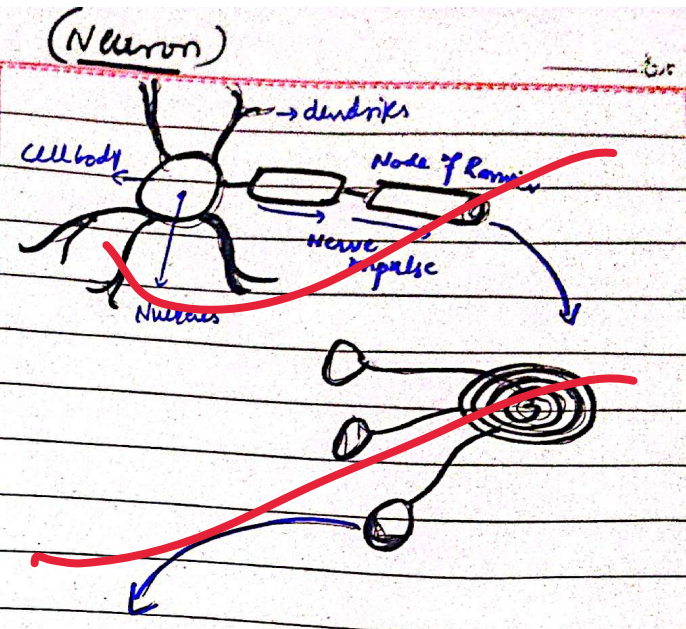
→ Peripheral Nervous System (PNS)

It connects the CNS to the rest of the body. Nerve branches out brain and spinal cord, extending to muscles and other parts of the body

(Neuron)

Neurons:- highly specialized cells that transmit chemical and electrical information in the body. It use short branched extensions called "Dendrites" to recieve nerve impulses from surrounding cells. These messages then travel through the cell body (somatic cells) to the Axon, a thread like structure. The impulse moves through the Axon and is transmitted via chemical or electrical signal that pass through a synapse.

→ **Neurotransmitters:** the chemicals that relay signals between neurons and bodily tissues - which includes Adrenaline, Dopamine, and endorphins.

Nerves:

Sensory	vs	Motor
Nerves which transmits the information from brain to body.		Nerves which transmit signals from body to brain.

(Diagram of Neuron)